

The rapid decline of Cs-137 concentration in Fukushima rivers

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The Fukushima Daiichi Nuclear Power Plant accident has released massive amount of radiocesium into the terrestrial environment, and the radiocesium have been transferred through terrestrial hydrological pathways in the last 5 years. The ¹³⁷Cs attached fine particle of soil has been by washing off by erosion, then transported by river in which particulate (suspended) materials, play the 90-99% of the transported materials in Japanese rivers.

In the Chernobyl affected area, land use has been found to be affected the cleanup of the contaminated terrestrial environment, but precipitation and the land use is quite different affected by the radionuclides by FDNPP accident. Here we show the results by intensive field monitoring campaign, started in June, 2011, 3 months after the accident, monitoring 30 river stations for detailed monitoring of activity concentration of radiocesium in suspended sediment and their flux flow through the river.

Total 13 TBq of Cs have been transported to ocean from Abukuma river, this corresponds to 2.5 % of the total fallout from July 2011 to August 2015. Analysis of the riverine transport by upstream land use reveals that higher percentage of Paddy field having largest rate of decline and also the highest flux, but the forest area showing lowest decline and smallest flux flowing downstream. The entrainment coefficient of dissolved water is quite low; due to high initial decrease by active land uses, combining with high flux, typically 1 order lower than the lower end by the report of Chernobyl affected area, suggesting the rapid recovery of Fukushima contamination. We also analyze the effect of decontamination works on the activity and flux of the suspended sediment in the rivers.

Keywords: Cs-137, Fukushima NPP accident, runoff from rivers